STATEWIDE LIGHTING MARKET TRANSFORMATION PROGRAM REPORT

JUNE 2013

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INTRODUCTION

This report is jointly submitted by Southern California Edison Company (SCE), Pacific Gas and Electric Company (PG&E) and San Diego Gas and Electric Company (SDG&E), referenced in this report as California's investor-owned utilities (or "IOUs"). In July 2008, the California Public Utilities Commission (CPUC) published a plan to dramatically increase energy efficiency in California. The California Long Term Energy Efficiency Strategic Plan (Strategic Plan) calls for transformation of markets for energy consuming equipment, including lighting, to maximize energy efficiency and minimize energy consumption and the production of greenhouse gasses. On September 23, 2010 the CPUC published the Lighting Chapter of the strategic plan which puts forth the bold goal of reducing lighting energy consumption in California by 60%-80% by 2020 (Chapter 13.4 Strategies: The Huffman Bill AB 1109 requires California to "reduce average SW electrical consumption by not less than 50% by 2018." California aims to achieve a 60-80 percent reduction by 2020). The Lighting Chapter outlines four goals:

1. Develop and implement coordinated policies, procedures, and other market interventions that eliminate barriers, accelerate lighting market transformation in California, and drive widespread adoption for best practice lighting technologies and systems.
2. Define and advance best practices for design, installation, operation, and maintenance of integrated systems to achieve sustainable energy efficient lighting solutions for all markets.
3. Create widespread end user desire for, purchase of, and use of best practice lighting technologies and systems.
4. Develop research, development, and demonstration (RD&D) networks to create, test, and deliver the lighting solutions needed to help transform California's lighting market to achieve California's Strategic Plan goals.

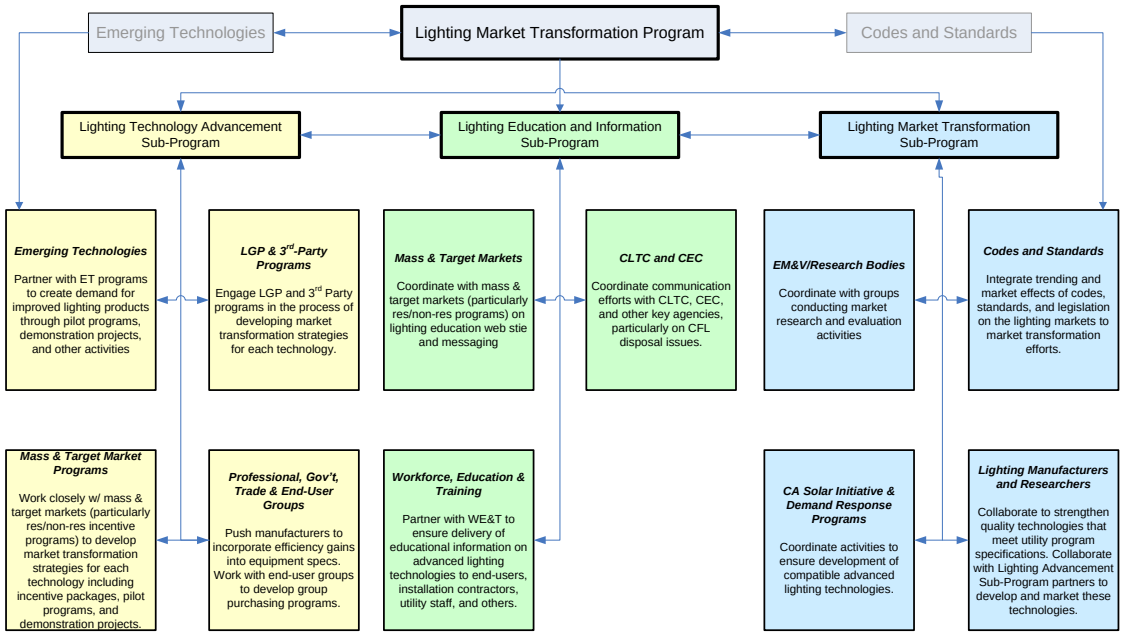
The Lighting Market Transformation (LMT) Program was initiated in the 2010-2012 program cycle. This program is an element of the California IOUs' efforts to actualize the goals contained within the Lighting Chapter of the Strategic Plan. The LMT Program has three goals:

1. Formalize a process by which the IOUs can rapidly introduce advanced lighting solutions and emerging technologies into the marketplace, improve existing lighting programs, and develop new program strategies.
2. Provide better access to education and information regarding existing and emerging lighting technologies for all market actors.
3. Formalize a process by which the IOUs can determine when a specific lighting technology has become sufficiently mainstreamed and no longer requires IOU program support.

Figure 1 illustrates the Program structure.

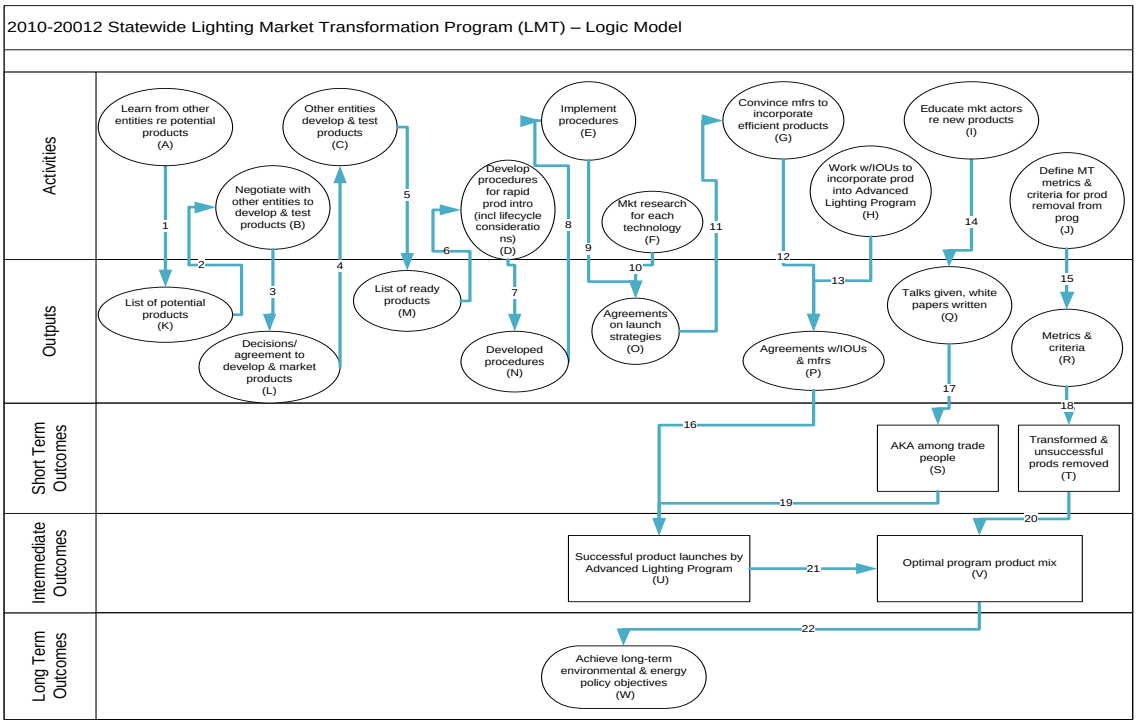
FIGURE 1: LIGHTING MARKET TRANSFORMATION DIAGRAM OF PROGRAMS

Lighting Market Transformation Diagram of Programs



Achieving market transformation in any of these technology categories requires strong coordination among the utilities, as well as with government and industry organizations. A model of how this collaboration occurs is highlighted in Figure 2: Statewide Lighting Market Transformation Program Logic Diagram.

FIGURE 2: STATEWIDE LIGHTING MARKET TRANSFORMATION PROGRAM LOGIC DIAGRAM



This joint IOU report is submitted pursuant to Commission Decision (D.) 09-09-047 (OP 22), which requires Statewide LMT Program updates on the following topics:

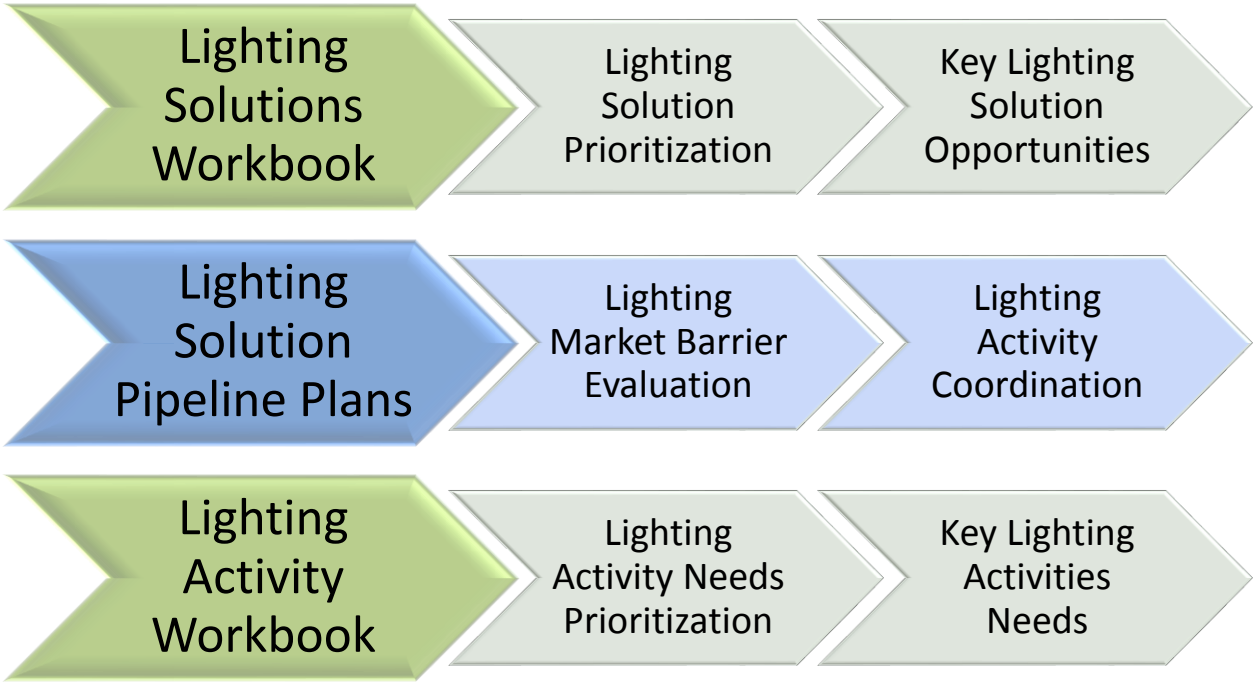
1. Annual plans for lighting solutions to be implemented in each key market segment (residential, commercial, industrial, agriculture, and exterior lighting);
2. A prioritized list of key lighting technologies, systems, and strategies that require LMT pipeline plans;
3. New or revised LMT pipeline plans for key lighting technologies, with plans based on market data. LMT pipeline plans will identify funding, partnerships, and necessary coordination with the following Commission efforts: Workforce Education and Training, Codes and Standards, Demand Side Management (DSM) Coordination and Integration, Marketing, Education and Outreach, Research and Technology and Local Governments; and
4. Status update on the design and development of at least one LMT pilot project for each market segment (residential, commercial, industrial, agriculture, and exterior lighting). Each pilot should be used as a vehicle to test new technology and program delivery mechanisms. The status update should include information on each pilot and collaboration with other utility programs and public and private partnerships.

This report is a vehicle for the IOUs to communicate how their coordinated actions are advancing the state's pursuit of deep energy reductions in the lighting market and, by proxy, how effectively LMT is meeting its goals. Additionally, as adopted in Resolution E-4385, this report includes an update on IOU progress towards one of the program performance metrics (PPMs) identified for the LMT Program: "4. Number of EE lighting measures added, removed, or updated as a result of LMT activities and influence, and reported in annual LMT June Report."

LMT PROGRAM FRAMEWORK

The framework for the LMT Program has been in development since 2010 with support from the Energy Division and the lighting industry. The program framework continued to evolve through 2012 and will be updated in 2013-2014 as more is learned about effective approaches to market transformation. The LMT Program is comprised of three distinct products each with corresponding activities to carry out the required actions to develop and support lighting market transformation efforts. Figure 3 illustrates the three primary program products and the corresponding activities.

FIGURE 3: LIGHTING MARKET TRANSFORMATION PRODUCTS AND ACTIVITIES



LIGHTING SOLUTIONS WORKBOOK

The LMT Lighting Solutions Workbook is a utility program planning tool. The tool provides a taxonomy of California's lighting installed base. In addition, the workbook contains estimates of energy savings available through upgrades to more efficacious lighting options across a variety of market segments. Further, the tool highlights market barriers for improving the lighting installed base in each market segment.

The Lighting Solutions Workbook also allows for a gap analysis in the existing data of the numerous studies in the California and national market. These gaps exist, in part, because there are studies that are outdated and/or missing. The workbook can aid the IOU and CPUC Measurement and Evaluation teams to plan for new studies.

The Solutions Workbook assists the prioritization of lighting solutions based on factors such as market sector characteristics, technology, and savings potential. This ability to filter by these factors enables programs to focus on relevant solutions or barriers for specific markets. The workbook can then be sorted by savings potential to ensure resources target lighting solutions with the largest energy savings potential.

The current Lighting Solutions Workbook was completed in January 2012. The Workbook and its accompanying detailed report are available on the Lighting Market Transformation Program website at http://www.lightingmarkettransformation.com/lmt-program-documents/. The documents are also available on the California Measurement Advisory Council (CALMAC) website at http://calmac.org/.

Given the tremendous number of lighting products available for utilities to support, the Lighting Solutions Workbook assists the IOUs to direct their efforts toward the greatest impact opportunities. However, it is important to note that the Solutions Workbook is a living document, and as additional information becomes available from various sources, the IOUs plan to update the Workbook to reflect the most current and relevant information. Because of the data refresh cost, LMT plans to update the Lighting Solutions Workbook as major studies become available.

The next update of the Lighting Solutions Workbook is currently being planned, expected to have preliminary results by the end of 2013, and completed early 2014. The workbook is planned to incorporate data from various studies, including, but not limited to:

California Specific Studies:

1. Lighting shelf study by KEMA (CALMAC posting complete)
2. LED market characterization study by KEMA (CALMAC posting complete)
3. Impact of AB1109 by KEMA (CALMAC posting complete)
4. SCE LED customer decision study (CALMAC posting complete)
5. PG&E customer choice study (available)
6. Completed lighting pipe-line study by Cadmus Group (available), and
7. Small commercial market characterization study by Waypoint (available).

Other Studies:

1. U.S. Department of Energy 2010 U.S. Lighting Market Characterization instrument (available now)
2. Energy-Efficient Lighting for Commercial Markets by Pike Research (Cadmus purchased; not available publicly)
3. Freedonia Industry Study #2773: Lamps to 2015 (Cadmus purchased; not available publicly)
4. NEMA Market Statistics available on www.NEMA.org (see example in Figure 1)
5. NEEP Residential Lighting Strategy Report
6. NEEA reports
7. DOE's Solid State Lighting Program (SSL) market studies and plans
8. U.S. Census Bureau lamp shipment data
9. ENERGY STAR® qualified LED Lamp & General Service Incandescent Lamp Price Tracking
10. Energy Information Administration Statistics on Energy Consumption
11. California IOU Energy Efficiency Potential Study from Navigant Consulting
12. The Market for High-Brightness LEDs in Lighting: Application Analysis and Forecast
13. Adoption of Light-Emitting Diodes in Common Lighting Applications from Navigant Consulting for U.S. DOE, and
14. Other lighting studies completed by other jurisdictions such as NEEA, NEEP, and others.

Studies Underway:

1. CLASS/CMST general population survey – finalized results may not be available until Q3'2013.
2. Residential and non-residential lighting impact studies – finalized results may not be available until the end of 2013.
3. Weighting of lighting shelf study – the un-weighted version is available now, but the weighted version may not be available until the end of 2013.
4. LED market effect study – results may not be available until the end of 2013.
5. SCE/PG&E lighting process evaluation and non-residential market characterization study – expecting final report by June 2013.

LIGHTING SOLUTION PIPELINE PLANS

The LMT Lighting Solution Pipeline Plans are strategy and coordination documents to support lighting market transformation. The Pipeline Plans articulate the market wants, needs, and key barriers associated with a lighting

solution and propose actionable utility and partner activities based on the best available technology and market data from the Lighting Solutions Workbook and Lighting Activity Workbook. The proposed activities are intended to help overcome barriers and increase adoption of energy efficient technologies, systems, and best practices to help achieve the goals of the California Energy Efficiency Strategic Plan. The IOUs plan to document these planned activities and their results in the Lighting Activity Workbook.

Two expanded Lighting Solution Pipeline Plans have been completed for the residential and exterior lighting markets. The expanded pipeline plans dive more deeply into these two market sectors. They provide more detailed information on what data exists, what activities have been done, and what activities are currently underway. Based on this information combined with input from utility program, government, and lighting industry experts, the plans ascertain the market barriers and provide recommendations on the necessary strategies, data needs and activities to overcome the specific barriers. Since this is the first time this kind of effort has been initiated, the LMT Program is evaluating the effectiveness of the expanded Pipeline Plans as an instrument for utility, industry and government coordination to help the state meet the long-term strategic plan.

The expanded Pipeline Plans were completed at the end of 2012 and shared with LMT partners and stakeholders at the LMT Stakeholder Meeting in early 2013 at SCE's Energy Education Center in Irwindale, CA. The documents are available on the Lighting Market Transformation Program website at http://www.lightingmarkettransformation.com/lmt-program-documents/.

LIGHTING ACTIVITY WORKBOOK

The Lighting Activity Workbook contains information about the various completed, on-going, and planned lighting activities (such as technology assessments, demonstrations, program trial studies, and measure and evaluation (M&E) market studies). These activities are distinguished between residential, non-residential, and their sub-markets. The Lighting Activity Workbook provides an overall view of lighting market transformation activities, allowing a high-level assessment of potential activity gaps. This supports the efforts in prioritizing and aligning lighting activities to efficiently and effectively overcome market barriers for the Key Lighting Solutions. The Lighting Activity Workbook also helps to reduce duplication of efforts, allowing utilities the ability to leverage data from recently completed studies and plan future studies in a coordinated manner.

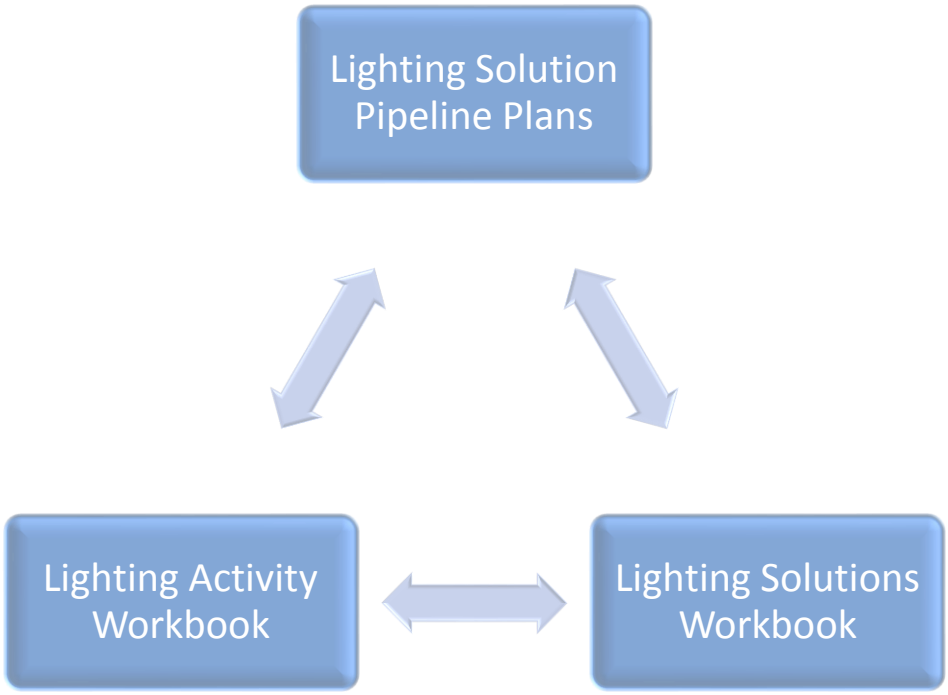
The Lighting Activity Workbook was completed at the end of 2012 with a total of 394 lighting activities tracked across 17 energy efficiency organizations, including utilities, government, and universities. Through coordination among the LMT partners involved in the effort, many aspects were applied to the activities to enhance future collaboration and coordination. These aspects include, project type, target sector, technology, application, and lead organization. Of the 394 lighting activities tracked, the breakdown of project types were:

- 102 Emerging Technologies activities
- 79 Education and Training activities
- 71 Work Paper Development activities
- 45 Codes and Standards activities
- 44 Incentive Program activities
- 31 Marketing activities
- 12 EM&V activities
- 9 Innovative Pilot activities, and
- 1 Market Transformation activity.

For further analysis or review, the Lighting Activity Workbook and its accompanying report are available on the Lighting Market Transformation Program website at http://www.lightingmarkettransformation.com/lmt-program-documents/.

These documents flow into and reinforce one another. The Lighting Activity Workbook will be used to document the various IOU activities in order to track and communicate progress. As progress is achieved in accelerating the

adoption of these technologies, the Lighting Solutions Workbook will be updated to reflect this progress and allow for a reassessment of priorities. The diagram below shows how these documents relate to one another.



COMMUNICATION PLAN

LMT Program Performance Metric #2 (PPM ID LMT-2), adopted in Resolution E-4385 as a metric type 2b to be reported at the end of the 2010-2012 program cycle, directed the IOUs to "develop a communication plan by March 2011 to make the lighting technology roadmap, pipeline plans, and technology resource information from this program available on the statewide marketing, education and outreach (ME&O) web portal by July 2011, and update annually."

The initial LMT Communication Plan was submitted to the Energy Division on March 31, 2011, and utilized the statewide Engage360 site as the web portal for posting the LMT Program information. The initial Communication Plan was the first step in expanding LMT efforts to involve LMT partners and stakeholders beyond the IOUs. On October 13, 2011 an Assigned Commissioners Ruling regarding statewide marketing noted that development and delivery of the Engage360 brand was costly and likely not producing enough ratepayer benefits to justify its continuance. The ruling directed the IOUs to freeze spending on Engage360, including the Engage360.com web portal, until further direction was provided by the Commission. On May 18, 2012, the Commission issued Decision 12-05-015 Decision Providing Guidance on 2013-2014 Energy Efficiency Portfolios and 2012 Marketing, Education and Outreach, which directed the utilities to fully transition all relevant materials to the Energy Upgrade California web portal, with the Engage 360 web portal decommissioned, by no later than the end of 2013 (D.12-05-015, OP 127). The IOUs will follow the Decision's directive to develop an updated communication plan that will transition all of the LMT Program information onto the Energy Upgrade California web portal before the end of 2013.

Updated communications with CPUC ED staff on March 15, 2013 provided additional guidance on the LMT communication plan direction. The IOU's agreed with CPUC ED staff that the EUC web site would not be the right place for LMT Program information due to the anticipated audience.The LMT Program primarily targets lighting program planners and implementers and generally not end-use customers, whereas the EUC website targets end-use customers. Under this new direction for 2013, LMT plans to continue to support ME&O with the proper

lighting information for the EUC website. The venue for LMT Program planning and coordination materials will be the LMT website, http://www.lightingmarkettransformation.com/.

KEY INDUSTRY INFORMATION GATHERING AND MARKET INFLUENCE ACTIVITIES

CONFERENCES, SEMINARS AND WORKSHOPS

Participation in conferences and workshops is essential for the LMT Program to remain up-to-date on new technologies, systems, and best practices to properly support energy efficiency (EE) program decisions in lighting. These events also allow LMT to expand the network of partners for future collaboration efforts within the energy efficiency and lighting industry.

CEE Program Meetings **January 24-26, 2012**

The Consortium for Energy Efficiency (CEE) develops initiatives for its North American members to promote the manufacture and purchase of energy-efficient products and services. This is an excellent event to gather and share information on utility program approaches and strategies.

Strategies in Light: Transforming the LED and Lighting Market **February 7-9, 2012**

The Strategies in Light event is a business conference and exhibition on high-brightness LEDs and lighting. The event is the premier annual forum for presenting current commercial developments in high-brightness LED applications. LMT attended to gather information on the status of significant and key lighting technologies for program planning and execution. In 2012, PG&E presented, along with the Design Lights Consortium, a session on how manufacturers of high performance lighting can best partner with utilities.

American Council for an Energy Efficient Economy (ACEEE):
National Symposium on Market Transformation **April 1-3, 2012**

The Symposium offers the opportunity for a diverse group of attendees to network, compare programs, learn about new market transformation approaches, and discuss the latest issues facing the energy efficiency and market transformation stakeholders. PG&E presented along with the Department of Energy's Pacific Northwest National Laboratory on California's efforts to transform the lighting market.

Solid State Lighting Design: 2012 SSL Summit **April 3-4, 2012**

The Summit looks to answer what is really meant by better lighting, how manufacturers and decision-makers come together to achieve it, what is working now, and where it will all take us in the next 2-10 years. SCE presented the LMT Program's framework and approach to enabling the most efficient route toward lighting market transformation. The presentation was very well received with a high level of industry interest in increased involvement in LMT activities and work products.

Department of Energy: Solid State Lighting Roundtable **April 11-12, 2012**

The Department of Energy hosted a roundtable to solicit feedback from a small group utility of lighting experts from around the country about what research gaps exist that are preventing broader adoption of solid state technology. The team, among others, provided valuable insights to the DOE pertaining to the needs of utility program planners and implementers. The shared information was used to update the DOE's Solid State Lighting program to better serve utilities across the nation. The DOE was interested in LMT Lighting Solutions Workbook and requested a copy.

LIGHTFAIR® International **May 7-11, 2012**

LIGHTFAIR® International (LFI) is the world's largest annual lighting trade show and conference. This is a significant annual lighting event to gather information from many sources in one location. Key information elements include updates on new industry trends and technologies. This information is critical for immediate plans as well as longer-term program plans. In the 2012 LFI trade show and conference, PG&E presented a training session, along with the Design Lights Consortium, on how manufacturers can best collaborate with utility lighting programs.

2012 DOE Solid State Lighting Market Introduction Workshop **July 17-19, 2012**

Lighting leaders from across the continent gathered in Seattle for the seventh annual Solid-State Lighting (SSL) Market Introduction Workshop, hosted by DOE. The audience was diverse and included representatives from industry, government, efficiency organizations, utilities, municipalities, designers, specifiers, retailers, and distributors. The purpose was to share the latest insights, updates, and strategies for the successful market introduction of high-quality solid-state lighting products. LMT served as a speaker at the DOE Solid-State Lighting Market Introduction Workshop where Vireak Ly shared information about the role of energy efficiency programs in helping to transform the lighting market towards more efficient lighting products. More information about the DOE Utility Roundtable is available here:
https://www1.eere.energy.gov/buildings/ssl/pittsburgh2012_highlights.html

Emerging Technologies Coordinating Council: Emerging Technology Summit **July 17-19, 2012**

The LMT Program supported the Emerging Technologies Coordinating Council's Emerging Technology Summit (ET Summit) as a speaker on "Lamp Replacements: A Turning Point for LEDs?" Vireak Ly shared that utility incentive programs are very interested in the benefits from the improved performance and lighting quality of LED lamp replacements. The session explained where the technology stands, where it is going, and the program challenges in making large-scale incentive programs for LEDs a reality. Find more information about the ET Summit at:
http://www.etsummit.com/2012/files/ET_Summit_Program.pdf

2012 American Council for an Energy Efficient Economy (ACEEE) Summer Study **August 12-17, 2012**

The 2012 American Council for an Energy Efficient Economy (ACEEE) Summer Study is the 17th biennial ACEEE conference on Energy Efficiency in Buildings. A diverse group of professionals from around the world will gather at this preeminent meeting to discuss the technological basis for, and practical implementation of, actions to reduce energy use and the climate impacts associated with buildings. There are several Lighting Market Transformation influenced presentations planned at the conference including an overview of the IOUs Lighting Solutions Workbook and PG&E's market incentive test results.

KEY MEETINGS

West Coast Utility Lighting Team Quarterly Meetings

The West Coast Utility Lighting Team is comprised of lighting experts, project managers, and program managers from utilities and organizations such as the Southern California Edison, Pacific Gas & Electric, San Diego Gas & Electric, California Lighting Technology Center, Sacramento Municipal Utility District, BC Hydro, Bonneville Power Administration, Seattle City Lights, and others. The purpose of the meetings is for all attending parties to share information about various lighting projects and activities. This helps avoid duplication of efforts and provides opportunities for collaboration and data sharing.

SCE, SDG&E, and PG&E LMT Program managers participate in the meetings three times a year to share lighting projects in the Energy Efficiency incentive, Emerging Technologies, Codes and Standards, and Demand Response Programs. The meeting also enables LMT to be aware of lighting projects, ideas, and technologies for potential inclusion into Lighting Solution Pipeline Plans.

In 2012, the SCE LMT and Emerging Technologies Programs hosted the meeting in Ontario, CA. LMT coordinated efforts among West Coast utilities to more effectively track planned, in progress, and executed lighting projects through the Lighting Activity Workbook. Additional projects shared for collaboration include Advanced Lighting Controls Application Certification, Exterior Occupancy Study and Menu Boards.

Codes & Standards Lighting Roundtable Quarterly Meetings

Representatives from the three IOUs, as well as outside experts and consultants, come together with representatives from the CEC and CPUC to discuss the current future state of codes related to lighting. This quarterly meeting touches on upcoming changes in the short term that will impact programs and customers, as well as longer terms goals of energy reduction that need to be addressed through the joint group.

Discussions in 2012 included the California Energy Commission's LED Quality Specification, Title 20, and Title 24.

RESIDENTIAL LIGHTING ACTIVITIES

The LMT Program is strategically involved in many residential lighting activities across the IOUs' various programs. This section highlights a select few of these activities impacting the residential market sector. Most efforts are coordinated across all the IOUs, except for targeted and region-specific localized activities. A full list of IOU residential lighting activities are provided in the Lighting Activity Workbook.

CEC QUALITY LED LAMP SPECIFICATION IMPLEMENTATION

BACKGROUND

The California Energy Commission (CEC) Quality LED Lamp Specification (Specification) is a voluntary high performance and high quality specification for the California lighting market. As such, manufacturers, distributors, and retailers are not prohibited from producing and selling products that do not meet the Specification in California. The Specification was developed in collaboration with the California Lighting Technology Center and the California Public Utilities Commission, which directs the California investor-owned utilities (IOUs) to only propose rebates for screw-based LED products that are consistent with the Specification.[1]

The Specification is intended to help reduce the major market barrier of poor LED lamp performance and create a positive perception of LED lamps in the residential market sector in California.

PROGRAM ACTIVITIES

The LMT Program supports incentivizing products with high quality specifications. The persistence of the increasing adoption rate of LED products depends on quality products that provide quality lighting. Many studies have found that the major market barriers to the long-term adoption of CFLs were low quality and performance during the early commercialization of CFLs. These studies include the Department of Energy report on Compact Fluorescent Lighting in America: Lessons Learned on the Way to Market[2] and CFL incentive program evaluations.

The LMT Program managers participated in the October 11, 2012 workshop to voice support for the effort to help increase market adoption of high quality LED products for the residential market sector.

The LMT Program held weekly conference calls with the CEC, CPUC, and IOUs to coordinate the program implementation of the quality standards. The coordination calls were intense and deliberate with the consistent goal of successful incorporation of the Specification into the programs. As various market barriers and challenges were discovered, the continued communications played a significant role in moving forward towards the goal for successful and cost-effective implementation of the Specification.

One of the key challenges for the IOU incentive programs to fully adopt the Specification in 2013 was the limited availability of products that can meet the Specification. As manufacturers were informed of the Specification timeline, they noted that they would require about a year to design, manufacture, test, and qualify their products before the products can be available for the public. For example, in order to be listed on ENERGY STAR®, new lighting products need to go through a 6,000-hour lumen maintenance test, which is at least an eight-month

[1] See Section 10.4 of the CPUC decision, here: http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/166830.htm.
[2] http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/cfl_lessons_learned_web.pdf

process. Because the solid-state lighting technology has progressed so rapidly, there has been no widely accepted methodology for expedited lumen maintenance testing.

In addition to the lack of standards for expedited lumen maintenance testing, there are other areas in the Specification where industry testing standards are needed for proper validation of key performance areas, such as dimming and flicker.

NEXT STEPS

Through the LMT coordination conference calls with the CEC, CPUC, and IOUs, all parties came to agreement on many of the challenges for a successful program roll-out of the Quality LED Lamp Specification. The coordinated decision making process allowed a one-year interim period in 2013 before the IOU residential lighting programs are required to only pay incentives for qualified products as qualified products come into the market. The team agreed on a "Best in class, Best in channel" solution for 2013. This agreement enables the utilities to provide incentives for the best performing and highest quality lamps available for the specific channel, such as big box retail and home improvement, among others. The utilities will continue to monitor the lighting market and encourage product development. In the meantime, SCE is leading the effort to review initial testing reports of products that claims to meet the Specification. On-going testing requirement discussions will continue until testing procedures are finalized across utilities, CEC, and the CPUC.

FIELD SERVICE TRIAL – SDG&E

SDG&E conducted Field Service Trial in 2012 as one of SDG&E's strategic initiatives in cultivating alliances and maximizing the synergies with retailer partners to increase the program cost-effectiveness and efficiency. The Field Service was designed to include ongoing collection of market information at the retail spaces and interactions with customers, which would inform SDG&E's continuous program improvement efforts. Key functions that SDG&E's Field Services provided were:

1. In-store training to retail sales staffs on energy efficient lighting and utilities energy efficiency programs;
2. Lighting technology demonstration to end-use customers;
3. Assistance in maintaining education material on efficient lighting at the points of purchase in the stores;
4. Ongoing collection of market information such as retail sales staffs' and customers' perception on lighting products and utility lighting program;
5. Pricing and availability of various lighting products at the retail spaces, etc.; and
6. Maintain ongoing SDG&E's presence and connections with its sales channel partners.

The 2012 Field Service trial had helped SDG&E to maintain ongoing and in-person working relationships with more than 400 retail outlets in San Diego, trained more than 157 retail staffs, conducted more than 81 in-store product demonstration to more than 1,000 customers, collected more than 2,000 customer and retailer surveys, tracked nearly 4,000 lighting products at the retail stores. The lessons learned from the 2012 Field Service trial have assisted SDG&E to improve its post-2012 Lighting Program for small and hard-to-reach retail outlets, maintenance of program presence at retail spaces, and customer education on how to choose light bulbs.

The Field Service assisted SDG&E in the validation that strategic partnerships with the industry would help the IOUs to be more effective in promoting energy efficient products and services, showcasing IOUs energy expertise, branding IOUs program successes, and maintaining high levels of customer satisfaction.

Based on the successes of this trial, SDG&E will implement Field Service as one of the ongoing element of SDG&E Residential Lighting program after 2012. The Field Services will support SDG&E's drive to increase program participation with national chain mass markets and local retailers to provide the following benefits:

- Expanding network that increase customer convenience
- Enhancing retail management support for energy efficiency lighting
- Establishing more opportunities for co-marketing and branding with retailers
- Expanding cooperation between utilities, retailers and manufacturers to promote and stock high efficiency lighting products, and
- Providing market information for energy efficiency lightings.

SDG&E RESIDENTIAL LIGHTING FIELD SERVICES PILOT PROGRAM IN-STORE DEMO & TRAINING

LED AMBIENT TRIAL STUDY – SCE

SCE designed and implemented a suite of tests to observe and evaluate a variety of approaches for informing the design of incentive programs for LED lighting at retail outlets. The approaches pertained to:

1. LED consumer purchase preferences, thinking, and behavior
2. Sales volume movements at different price ranges
3. Customer experiences with LED products
4. The effects of customer knowledge and education
5. The effects of store displays
6. The effects of various promotional messages
7. The product characteristics for which customers express demand, and
8. Modeling for market characterization and forecasting.

For the full details about the sections listed above, please see the full report available at http://www.lightingmarkettransformation.com/.

Two aspects of the LED Ambient Trial Study are articulated in this section of the LMT Program Annual Report.

MESSAGING TEST

Objectives

SCE sought to understand how to educate consumers about the benefits of LED lighting in retail stores. Given in-store education will also exist from both the retailers' and manufacturers perspective, it was important to determine what messaging elements are appropriate from SCE's (i.e. the utility's) perspective. The research objective was to provide a quantitative assessment of potential new SCE LED lighting messaging concepts among

SCE residential customers that would inform which were would be most effective at retail. Marketing Research surveyed 155 SCE residential customers in a 10-minute quantitative survey.

Learnings

Five messaging concepts clearly resonated well with respondents as indicated by their individual ratings and subsequent selection as "Liked Most":

- Make changing a light bulb a chore of the past - this LED bulb lasts over 20 years.
- The LED lifespan: 25 years - pretty good for a light bulb.
- Save over $10.00 per year in energy costs by replacing one incandescent light bulb with one LED bulb. That's over $50 in just five years.
- Shrink your lighting bill with LED bulbs.
- Confused about LED bulbs? Here are the facts...

Overall study implications suggest SCE-sponsored retail messaging should focus on education about the 'savings' benefits that come from the life of the bulb. Customers have a high interest in being educated about LEDs. Results indicate customers are motivated by the longer life of the bulb and the potential cost savings.

MERCHANDISING DISPLAY TEST

Objectives

The merchandising test objective was to evaluate which type of display stimulated LED sales in the retail environment. Retailers are challenged in educating customers about LEDs and use various merchandising and messaging tactics that clutter the aisle. In addition, LEDs are a considered purchase, even for early adopters who are already educated before they see in-store retail education and messaging.

The Strategic Alliances Management (SAM) group installed a small sample of various displays at select retailers for several weeks and monitored sales for lift in sales. These display types include shelf, side stack, and palette. The unique displays were developed by the SAM Merchandising Manager after evaluating several messages and concepts that may appeal to retail customers.


Shelf


Side Stack


Palette

Unique

Shelf

Side Stack

Palette

Unique

Learnings

Analysis of the monitored sales data shows there is no stand-alone display type in the emerging LED marketplace that stands out as being the most effective to promote LED sales. LED prices have the largest influence in consumers' purchasing decisions in the retail environment. Merchandising displays are most effective when used to highlight promotional pricing.

LIGHTING FAIR TRIAL – SDG&E

The lighting markets are going through very exciting period with numerous lighting technologies competing for market shares. One of the strategies that California IOUs employed for increasing widespread market adoption of high efficient lighting technologies is to work with market actors to create and promote positive perceptions of efficient lighting solutions and to cause the customers to have a stake in the adoption of these new lightings.

In 2012, SDG&E conducted a limited trial of Lighting Fair, an innovative approach for driving positive perceptions of energy efficient lighting through highly focused product education, demonstration and promotion events for new lighting technologies at high-density employment centers in San Diego. After the hand-on demonstration of new high efficient lightings, the Light Fair staffs encouraged customers to purchase a sample kit of efficient lightings at an attractive promotion price that could not be match anywhere in San Diego. The customer's purchase of the sample kit, instead of give-away, caused the customer to have a stake and encouraged them to try out their new lightings at home.

The Lighting Fair concept supports the Strategic Goal 2.1.3 and Decision 09-09-047 by "begin to phase traditional mass market CFL bulb promotions and giveaways out of program portfolios and shift focus toward new lighting technologies and other innovative programs that focus on lasting energy savings and improved consumer uptake".

Key highlighted of SDG&E 2012 Lighting Fair trial:

1. 5 Lighting Fair events at large corporate employment sites in San Diego, which all of participated corporate partners requested SDG&E to hold the events again in 2013 to help promote green life style to their employees.

2. About 1,200 customers participated and bought promotion lighting kits that consisted of 16,000 highly efficient lights.
3. Over 600 customer surveys were collected, which provided insights on how customers purchased lightings. These insights guided SDG&E in the redesign of its marketing and outreach for post-2012 Lighting Program.
4. The incremental cost to SDG&E 2012 Lighting Program budget due to the 2012 Light Fair trial was about $6,000.

Based on lessons learnt from the 2012 Light Fair trial, SDG&E has decided to implement Light Fair as a permanent element of SDG&E Residential Lighting Program. Additionally, SDG&E evaluates possible extension of the Light Fair model to support targeted market education on electronics phantom loads, and how to use Smart Power Strip to reduce wasteful phantom loads for the Statewide Plug-Load program.

LIGHTING SHOWROOM TRIAL – SCE

OBJECTIVES

SCE launched the midstream trial from September to December 2011 and later re-launched it from April to November 2012. The trial was conducted in ten "big box" retail stores in Los Angeles County and Orange County and featured eight GU-24 pin based fixtures.

As reported in the 2011 LMT report, the Lighting Showroom Trial tested two main objectives. The first objective was to test consumer adoption of high-end, energy-efficient ceiling and wall fixtures for installation in existing, inhabited residences. The retailer offered point of sale discounts to the qualifying models so customers instantly

received their trial incentive. The second objective was to test the effectiveness of a utility merchandising strategy in the "big-box" retail environment and whether it influences customer purchasing behavior. The merchandising components include hang tags, price stickers, and shelf signs to draw customers' awareness to the reduced prices on qualifying fixtures.

LEARNINGS

The 2012 re-launch allowed the trial to address challenges from 2011. Keeping the merchandising components visible is a common obstacle at retail. As a result, customers were unaware of the trial discounts and benefits. In April's re-launch, SCE increased the number of onsite audits to ensure the material the materials were evident in the lighting aisle. Another challenge addressed in the re-launch involved the low customer participation in the M&E survey. There was a lack of survey participation from customers. To increase participation, the tear sheets reflected the gift card and its dollar value so customers were aware of the award and enticed to participate.

The trial was completed in stores in November 2012. Although there was incremental lift in GU-24 pin based sales, it was decided that the trial would not roll out into a full program until further information was collected.

MARKET INCENTIVE TESTS – PG&E

In 2012, IOUs began to reduce support for CFL products and will continue this effort through the coming program cycle. PG&E's CFL rebates that were previously focused on major big box retailers have shifted to retailers targeting lower income customers, such as discount and ethnic grocery stores, and discount general merchandise stores.

In order to support this shift away from CFLs and towards LEDs, PG&E conducted two market incentive tests in 2011 and 2012 to determine the optimal incentive level / price to influence purchase of certain LED lighting products. The test was done in Mass Market retailers, Home Improvement retailers, and Membership Clubs. During the test period, stores had different incentive levels for a certain timeframe, before the incentive levels were changed. PG&E expected sales to naturally increase with the highest incentive, and observed sales increase ranging from 101%- 460%, depending on rebate level and product. The lowest price level (highest rebate) generated the largest sales uplift. However, PG&E's study observed a diminishing rate of return between the median and the highest level. PG&E concluded that the median rebate amount was the optimal level.

In addition to validating PG&E's incentive approach, PG&E was able to apply a number of other lessons to the actual program rollout. First, marketing, signage, and education are important factors in the adoption levels of end-use customer and must be addressed in real-time. Clearly identifying the rebate and sale price boosted sales, but keeping signage up to date as rebates changed was a challenge. Learning from the test, PG&E adjusted its signage approach, using large signs to draw the consumer to the general area, then a smaller sticker beside the product price tag on the shelf to identify the rebate.

PG&E also learned that customer demand for LED products is high, as long as products reach the right price levels. During the test, the manufacturer and retailer underestimated the impact of the rebate, and ran out of products in some stores. This lesson will help PG&E improves its forecasting and allocations with retailers and manufacturers.

After these incentive market tests, PG&E began offering deemed rebates through our Upstream Lighting Program for LED products in 2012. In 2013, PG&E plans to continue its support of LED products in the mass merchandise and hardware channels, and transition to supporting LED products that meets the CEC LED Quality Specification as products become eligible.

OPERATION LAMP EXCHANGE – SCE

OBJECTIVES

The SCE Torchiere and Plug-in Lamp Exchange Program, also known as Operation Lamp Exchange (OLE), is a targeted lighting program that exchanges incandescent and halogen portable lamps for new, ENERGY STAR rated fluorescent lamps of a similar category. As described in the 2011 LMT report, the program offers exchanges to SCE customers who bring in portable lighting fixtures including torchiere lamps, floor lamps, table lamps, and desk lamps, and then reports on the energy savings resulting from the customer exchanges.

LEARNINGS

Program funding has decreased in the last two years and as a result, some changes were made in 2012 to ensure these events were still offered in SCE's CARE communities. SCE is committed to delivering dollar savings on customers' energy bills and overall energy savings to the grid through these lamp exchanges. In the CARE territory, there were four two-day events in 2011, and three one-day events in 2012.

The program implemented a change in the rule that customers could exchange up to five lamps instead of ten. This adjustment aligned with the average number of lamps exchanged at one time and was more cost-efficient for the program. In the first event, the average number of lamps exchanged dropped to 2.5 and the events fell short of goal. In the last two events, the rule was changed and customers could bring up to ten lamps. As a result, all three events exceed the 2012 kWh goal.

The program also introduced a rule in 2012 regarding customer's previous participation. A customer was limited to a maximum of 10 working lamps per household during the 2010-2012 term of the program. If the customer exchanged 10 or more lamps, they were ineligible to participate. Previous participation was verified using customers' driver's license against past participation database. Some customers were frustrated because they could not recall when they participated or how many lamps they have exchanged, but SCE worked with them to ensure customer satisfaction.

OLE has produced benefits for both SCE customers and participating retailers. The retailer's promotion of OLE and energy efficiency creates a positive association with sustainability. The retailer distributed event flyers and displayed information about OLE inside their store. However, the most effective marketing tactic was the Mail Flyer/Pennysaver. Other traditional approaches include messaging through bill inserts, flyers, emails, and ads. In addition, SCE has leveraged local partnerships with city governments and uses social media send notices and reminders.

SCE is always looking to explore opportunities to collaborate with retailers to engage with mutual customers at events. The events attract a large number of customers to retailer locations. One store location took advantage of the opportunity by conducting a "Sidewalk Clearance" sale to engage customers in line and offering shopping coupons available for participants of the event. A program goal in 2013 is to have retail locations collaborate with SCE in the same way to benefit participating customers.

TOPTEN USA – PG&E

PG&E served on the advisory committee for TopTen USA. In 2012, TopTen USA launched their first lighting product lists for PAR30 and PAR38 LED replacement lamps. PG&E continues to work with TopTen USA to build brand awareness and find opportunities to apply the lessons learned in the programs.

WEB CHANNEL – PG&E

In May 2011, a major on-line retailer approached PG&E wanting to explore participation in utility programs. PG&E continued to work with this retailer throughout 2012 and engaged members of the Western Region Utility

Network to expand the reach of this trial. The goal is to launch a small program in 2013 under the Lighting Innovation Program.

WEB TRIAL PROGRAM – SCE

The Web Trial Program is an element of the Lighting Innovation Program designed to test the viability of internet retailers as a channel for customers to purchase energy efficient lighting products. Incentives are offered through participating "online retailers" where customers benefit from various discounted LED lamp products, such as A-line, PARs, MRs, reflector, and dimmable lamps.

The objective is to test the viability and cost-effectiveness of the online sales channel as a scalable program intervention strategy to increase awareness and adoption of energy-efficient lighting products.

The World Wide Web is a technological advancement that allows many organizations to market and sell services and/or products in a strategic alignment that coincides with demographics. Using an online retailer as a tool to reach out to SCE's customers makes sense since many consumers browse the internet to purchase products. SCE is in a position to secure online retailers to assist with our efforts and goals. Using the internet to the fullest capability via these online retailers not only warrants the need to provide discounted energy efficient lighting products but also creates the perception of value to our customers.

The previous program cycle included only CFL products for which data demonstrated that sales of incentivized products decreased towards the second half of the program cycle. This was mainly due to the lack of marketing efforts from the web retailer and the lack of education and information relating to CFLs. Survey results also showed that customers were not happy due to the poor packaging of the CFL products resulting in the breakage of CFL bulbs attributed to shipping. Due to program key findings and the results obtained through the Measurement and Evaluation (M&E) team, SCE is now able to advise and provide feedback to the online retailers so that they can adjust to such circumstances.

For 2013, in support of the California Energy Commission (CEC) Quality LED Lamp Specification, the Web Trial Program is supporting quality LEDs as part of the new program cycle. The Program is able to help address the market challenges relating to the education and information pertaining to lighting quality, performance, and proper application of LED lamps. The 2013-2014 program cycle includes LED products for which the potential online web retailers understand that LED lamp products are unique in design and offer different performance characteristics; therefore they are providing a more user-friendly website that not only allows the customer to purchase discounted products, but also explains the different performance characteristics attributed to LED lamps. One online web retailer has created infomercial-type videos that can be accessed via Youtube.com that shows how different LED lamps should be used in various residential and office applications. This allows the consumer to make a well-informed decision before purchasing. Not only does the customer save energy, but is also content because the lamp meets and/or exceeds expectations and properly satisfies lighting needs.

Agreements have been drafted and distributed between SCE and the potential web retailer participants. SCE is currently in discussion with each entity and is finalizing any logistical matters relating to the implementation of the program. This cycle will be more streamlined because the entities that participated in the previous cycle are also participating in the 2013-2014 program cycle, allowing SCE and the web retailer implement better marketing tactics and providing a positive online user experience. Most importantly, in order to have a better survey response rate from those SCE customers that purchased from a participating web retailer, a 3rd party vendor will not be solicited to conduct a survey for SCE will conduct the survey internally.

Processes are established that will allow the online retailer notify the Program Manager of when a purchase has been completed by an SCE customer. The Program Manager will allow two weeks to ensure that the customer received the product and installed in their light fixture. After two weeks, the Program Manager will send a survey link to the customer via Surveymonkey.com and the results sent back to the Program Manager. All the data will

be forwarded to the M&E group for review and analysis. The data will provide an indication of the program's effectiveness at the end of the program cycle. Given the history and past experience with CFLs, it is important to carefully cultivate customers' awareness, knowledge, and attitudes towards LEDs. SCE is carefully implementing this program to leverage the online sales channel to increase awareness, education and adoption, and test its ability to scale up to larger volumes, products, and online retailers.

NON-RESIDENTIAL LIGHTING ACTIVITIES

The LMT Program is strategically involved in many commercial, industrial, and other non-residential lighting activities across various programs throughout the three investor-owned utilities (IOU). This section highlights a select few of these activities impacting the non-residential market sector. Most efforts are coordinated across all the IOUs, except for targeted and region-specific localized activities. A full list of IOU non-residential lighting activities are provided in the Lighting Activity Workbook.

ADVANCED LIGHTING ACTIVITIES – PG&E

EMERGING TECHNOLOGIES PROJECTS

Through the Emerging Technology (ET) program, PG&E undertook a number of technology assessments focused on LED lighting applications. As these lighting categories expand, and more products are added to the qualified product lists used by the IOUs, PG&E wanted to have a clear understanding of the opportunities, challenges, and costs associated with these products.

ET projects tackled recessed fixtures in office, high bays in warehouses, track head replacement fixtures in grocery, and a full change out to LED in retail. Each of these applications allowed for a comparison to the incumbent technology as a baseline, and helped to demonstrate the quality of light and level of savings possible with LED fixtures. One grocery assessment finished in 2012 and showed significant energy savings and maintenance cost reductions, while the assessments of retail, offices, and warehouses are ongoing for completion in 2013.

These ET projects have demonstrated that these technologies are ready for widespread adoption, and have informed (or will inform) future offerings in energy efficiency (EE) programs. All of these technologies are available in the customized retrofit program, and the IOUs plan to add deemed measures for these technologies in 2013 and 2014.

DEMONSTRATION SHOWCASES

In order to help spur adoption of advanced lighting technologies and advanced controls, PG&E developed a number of demonstration showcases for both customers and contractors. These showcases demonstrate the effectiveness of LED products in different building and space types, and the power of controls to use the LEDs to their fullest potential. It also gave customers a chance to try out the technologies and compare them to traditional lighting sources like halogen and fluorescents.

The LUX Retail Showcase at California Lighting Technology Center (CLTC) focused on directional replacement lamps (PAR-38 and MR-16) in a realistic retail setting. The showcase was meant to help retail customers become comfortable with switching to LED by showing them a comparison to traditional halogens. The showcase attracted retail customers from throughout the PG&E service territory and has helped them to switch to LED directional lighting. This demonstration project provides a map for future efforts targeting specific business segments and helping them to overcome the initial hurdles around adopting advanced lighting.

The two PG&E education centers also installed various advanced lighting fixtures and controls options in classrooms. The key piece of this effort is that the education centers touch thousands of people each year who are installing and specifying lighting equipment. By demonstrating the options available in the market in a real-world setting, contractors and customers taking classes can see first-hand the difference that advanced lighting can make in a classroom and office environment. They can also test various control systems in practice.

ADVANCED LIGHTING CONTROL SYSTEMS – PG&E

Combining advanced lighting technologies with a bundled advanced control system will allow customers to unlock the full energy saving potential of the next generation of lighting products. In 2012, PG&E focused efforts in the Emerging Technology Program on pairing different control systems with different lighting technologies across a diverse set of end-use applications to analyze the savings potential for these systems. These projects allowed for a broad understanding of the savings potential, as well as the challenges with implementing these bundled solutions. In addition, the projects highlighted the cost effectiveness of both the dimmable technology and the control system itself.

These ET projects looked at a diverse set of building types and lighting technologies, including LED high bays for warehouses, linear fluorescent troffers with dimmable ballasts in an office space, and LED troffers in an office space. The office project with dimmable linear fluorescent ballasts has finished and the report is posted on the Emerging Technologies Coordinating Council (ETCC) website, but the other projects are ongoing and will finish in 2013.

These projects demonstrated that controls can provide an additional 20-40% savings over the more efficient lighting technology, depending on the building and control strategies used. Control commissioning, especially for daylight harvesting, was also an important point that came out of our ET projects. Systems where the desired lighting strategies were carefully mapped in advanced, and the controls were installed and commissioned by experienced contractors worked the best. Customers also benefit from systems that were easy to adjust after the initial commissioning, especially for task tuning as users need more or less light depending on their particular preferences and tasks.

In the 2013-2014 program cycle, PG&E was able to apply the initial lessons from these projects to help create a new advanced lighting control incentive in the customized program. By pairing three control strategies, customers can receive $0.08/kWh instead of $0.03/kWh for single control strategies. This program will help to prime the market in advance of Title 24 code changes in 2014, while also providing a first step to encourage a bundled, system approach to controls that will provide additional savings.

ALCS M&V GUIDELINES

As Advanced Lighting Control System (ALCS) studies become more prevalent, the IOUs and the Sacramento Municipal Utility District (SMUD) began to develop a set of measurement and verification guidelines to promote consistent testing and reporting. Because of the great number of variables associated with advanced control systems and building type, the ALCS M&V effort seeks to standardize measurement processes and reporting in order to provide a clear comparison of projects across IOUs and building types. The guidelines will allow information and conclusions on savings from projects to be compared more easily, which makes each project more useful to the entire statewide team.

Most importantly, the guideline provides a template for data collection procedures that isolates the baseline, from the individual control strategies, and the bundled, all-on system. By creating these separate measurement processes, the effectiveness of each strategy can be referenced and analyzed by customers.

This effort began in 2012 and being finalized in 2013. In advance of the final draft, all new ALCS projects undertaken by the IOUs and SMUD are using the draft to help inform and improve the guidelines, and to start the data collection process for the upcoming cycle.

This California effort has also helped to inform the national ALCS M&V guideline under development by the Consortium for Energy Efficiency (CEE) and the National Electrical Manufacturers Association (NEMA).

By collecting and comparing this information across California and the nation in a consistent manner, the IOUs hope to inform future calculated and deemed offerings for controls, and figure out the best way to claim savings for a bundled system approach.

CALIFORNIA ADVANCED LIGHTING CONTROLS TRAINING PROGRAM (CALCTP)[3] – SCE

In 2012, CALCTP successfully obtained a $5 million grant from the U.S. Department of Labor to increase the number of CALCTP-certified electricians in the state to over 1,800. CALCTP now has over 32 training sites in the state. Data from the U.S. Department of Labor shows that 65% of electricians unemployed or underemployed at the time of the class have been able to secure a job and retain employment for at least six months. 95% of the employed electricians were able to stay employed in the first six months upon successful completion of the class.

CALCTP also has trained over 300 electrical contractors in lighting controls sales, marketing, and finance and has certified over 85 companies throughout the state. These companies have both senior officials and mid-level managers in the company that understand lighting controls theory, installation, and pricing, and marketing. Because of the competitive nature of the program, the Sacramento Municipal Utility District (SMUD) is the first utility in the state that has an incentive for CALCTP certified contractors.

The program continues to grow as CALCTP received a $750,000 grant from the Employment Training Panel in March 2012 to train an additional 539 electricians in the program. Furthermore, all three IOUs have provided financial support in the 2012-2014 program cycle to continue to update the curriculum and expand the program to new electricians and electrical contractors.

In 2012, the program was adopted by three states—Washington, Michigan, and Illinois—and the CALCTP was renamed the National Advanced Lighting Controls Training Program (NALCTP).

Finally, in December 2012 the CEC created requirements for acceptance technicians (or commissioning agents) in the state. CALCTP was the only program grandfathered in as an interim acceptance technician provider given its extensive credibility in the state. As back-up, in 2005, the Building Energy Efficiency Standards (California Code Regulations, Title 24, Part 6) required that specific equipment and controls installed in nonresidential buildings be tested according to Energy Commission adopted “acceptance testing” protocols to demonstrate their proper installation before the building may be approved for occupancy. Studies and stakeholder comments indicate that acceptance testing occurring in the field is currently inadequate. Because of inconsistent levels of training, Field Technicians as a whole are not ensuring that the installed systems are delivering the energy efficiencies and monetary savings expected by building owners. Thus, new regulations were developed and implemented in December 2012 to create a lighting controls acceptance technician certificate.

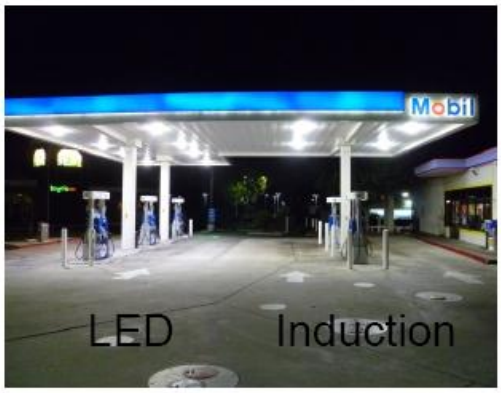
With CALCTP developing curriculum on lighting controls installation and commissioning, SCE and several other utilities across the country wanted to focus on lighting controls design. Thus, in 2012, a separate but closely aligned effort was started as a nation-wide initiative to develop a credential for lighting engineers and specifiers on lighting controls, the National Advanced Lighting Controls Application Certification.

[3] CALCTP update narrative provided by the California Advanced Lighting Controls Training Program. Find more detailed information about the program at https://www.calctp.org/.

EFFICIENT GAS STATION CANOPY LIGHTING RETROFIT – SDG&E

There are significant operation and maintenance savings for retrofitting Metal Halide or High Pressure Sodium (HPS) lighting that are universal for gas station canopy lighting, to LED or induction lightings. However, gas station operators are generally hesitant in changing to newer lighting technologies due to concern of change in the "look" of the lighting, because this is an integral part of gas station marketing.

In Q3'2012, SDG&E recruited a gas station owner that was willing to participate in SDG&E Emerging Technology project that demonstrated side-by-side options of LED, induction, and high-intensity discharge (HID) lighting as shown in the photos below. After testing different lighting options side-by-side, the customer opted for the LED product. The final report will be issued by the end of Q2'2013.



MIDSTREAM INCENTIVE TRIAL – SCE

BACKGROUND

The downstream delivery mechanism has been the preferred intervention method to promote energy efficient lighting products for the non-residential market. The approach allowed building owners and private business entities to receive incentive dollars for projects that meet program eligibility requirements. However, recent reductions on claimable savings as well as the downward adjustments to the total resource cost (TRC) levels for lighting products has made it less cost-effective over time. Because of this trend, a midstream approach was considered in mid-2012 as a potentially more cost-effective option moving forward. The midstream channel is primarily comprised of distributors and wholesalers, who play a significant role in providing lighting products in the non-residential market sector. The midstream approach was proposed in the Lighting Innovation Program's program implementation plan to the CPUC in mid-2012 and approved in late 2012.

PURPOSE

The Lighting Innovation Program's Midstream Incentive Trial Study will attempt to evaluate and test the new program delivery mechanism. This will be done by evaluating the potential impact of the midstream delivery method using a "buy down" pricing strategy. The distributors will discount contractor wholesale prices at the point of sale and will receive an incentive payment for the difference from SCE. The Midstream Trial plans to measure other non-resource benefits and prove if a sales lift of energy-efficient lighting products is attainable from the incentives. The trial will help identify trends in the LED market and pinpoint any barriers that may exist, as well as help build strategic relationships between utility and distributors with the intent of scaling up the program in the future if successful. Based on this experience, SCE and other utilities will be able to develop other programs that target a larger group of participants to achieve broader energy-saving goals.

NEXT STEPS

SCE has been working in collaboration with distributors, Measurement and Evaluation (M&E), CPUC, and others to ensure the program strategy, design, contracts, and implementation details are sound in order to collect the proper data cost-effectively to inform future program designs. The majority of the planning work is complete and the program is set to launch at the end of Q2'2013.

MIDSTREAM LED REPLACEMENT LAMP PILOT – PG&E

In July 2012, PG&E launched a midstream channel test for LED directional replacement lamps. The goal of the test was to show the impact of a distributor-based midstream program on advanced lighting sales, while also developing and testing our internal systems in advance of a full program launch. Midstream incentive programs have been successful in other areas for PG&E, but it has not been tried for Lighting in a number of years. As systems have improved, this channel has proven to be impactful and cost-effective.

The pilot included four electrical distributors and one third-party direct installation implementer. The distributors had the option of keeping some of the rebate or passing it all on to the customer; all four of the distributors passed along the full rebate amount to the end-use customer, reducing the cost of lamps by 50% or more. The implementer provided a direct installation option for customers that required additional co-pay for LEDs.

This pilot made clear that customers' interest in LEDs is high, but a significant incentive is needed to get them over the first-cost hurdle. Each of the participating distributors showed an increase in LED replacement sales with our incentives, and the third-party implementer demonstrated significant interest from small business customers, even with an additional co-pay for the LED products. By including both distributors and an implementer, the potential for double dipping was tested and systems were put in place to prevent it.

PG&E was able to directly apply the lessons and systems to a full LED Directional Replacement Lamp program that was launched with distributors in the midstream on April 1, 2013 as part of the Lighting Innovation sub-program. PG&E plans to expand this midstream offering in 2014 to include a full suite of LED replacement lamps, including A-Line, R/BR, candelabra, and globes.

NATIONAL ADVANCED LIGHTING CONTROLS APPLICATION CERTIFICATION (NALCAC) – SCE

The National Advanced Lighting Controls Application Certification (NALCAC) initiative is the next step in the lighting market transformation towards increased adoption of quality, adaptive, and efficient lighting and controls. Where the CALCTP was squarely targeted at the market barrier of limited knowledge and skills to effectively and efficiently *bid, install and commission* advanced lighting controls; the NALCAC initiative is targeted at the market barrier of limited knowledge and skills to properly *design and specify* advanced lighting controls. Through discussions with the lighting industry and CALCTP-certified contractors, it was recognized that without the proper

design and specification of advanced lighting control systems, the contractors would not have the chance to implement such systems for their customers.

The purpose of the NALCAC initiative is to build a robust curriculum that will deliver the knowledge and skills necessary to help achieve consistent high quality energy and demand savings through the best practice design and specification of advanced lighting controls. Proper training on best practice lighting design and specification, coupled with the quality installation skillset of CALCTP-certified contractors, would help overcome the major barriers of advanced lighting control adoption.

SCE initiated discussions on the concept and potential of a lighting designer, engineer, and specifier certification in Q1'2012 with the Illuminating Engineering Society of North America (IESNA) and the International Association of Lighting Designers (IALD). With their support,[4] the planning and development began in Q2'2012. The core project team is comprised of Chip Israel, FIALD, and Jim Benya, FIALD, to assemble leading industry experts and resources to develop the full curriculum and certification program.

The initial funding and certification development phase is comprised of multiple tasks, listed here:

- Body of Knowledge: An expert task force meets periodically to establish the current Body of Knowledge (BOK) on which the curriculum and testing is based upon.
- Jobs Analysis: An expert task force meets periodically to determine relative job activity percentages for the purposes of testing and certification weighting.
- Curriculum: Curriculum is developed by a committee of experts to teach the Body of Knowledge, and the committee accredits complying providers.

These tasks were initiated in 2012 and expected to be completed in 2013. The second phase of the initiative includes acquiring external (non-utility) funding and hiring a management company for the non-profit administration of NALCAC.

SDSU T8 LED DIRECT REPLACEMENT – SDG&E

There are great market interests in LED replacement lamps for the prevalent fluorescent troffer "T" lamp. Although the economics may be similar to fluorescent products at this time, many customers are interested in the enhanced light quality and absence of mercury of LED T8 solution.

In Q4'2012, SDG&E Emerging Technology identified an LED T8 product with 4000°K CCT that meets the requirements for safety, simple installation retrofit, acquired DLC listing. The 3500°K and 5000°K CCT models by the same manufacturer are obtaining DLC listings. This LED T8 product was installed at a test site in Q4'2012 and successfully demonstrated reduced energy consumption, increased longevity, and improved lighting quality. ROI and other quantitative metrics are pending the release of project's M&V report in Q1'2013.

[4] http://www.iald.org/WhatsANALCAC.asp

EXTERIOR LIGHTING ACTIVITIES

The LMT Program is strategically involved in many exterior lighting activities across various programs throughout the IOUs. This section highlights a select few of these activities impacting the exterior market sector. Most efforts are coordinated across all the IOUs, except for targeted and region-specific localized activities. A full list of IOU exterior lighting activities is provided in the Lighting Activity Workbook.

EXTERIOR OCCUPANCY SURVEY – PG&E

Working with the California Lighting Technology Center, the California IOUs are instituting an exterior occupancy survey. This survey will look at four different parking lots serving different types of customers across the state. The goal is to develop an understanding of usage patterns to improve future exterior controls offerings. Planning for this project began in 2012, but installations and assessments started in spring of 2013.

PLASMA AND WIRELESS CONTROLS – PG&E

PG&E launched an assessment of Light Emitting Plasma (LEP) and Wireless Controls through the emerging technology program in 2012. This goal of this project is to assess the performance of LEP in a high mast application, both in comparison to the currently installed high-pressure sodium, but also across generational improvements in the LEP product itself. The hope is to determine if LEP has advanced enough to be ready for market adoption as a replacement for HPS. The paired wireless controls allow for simple control and monitoring, and make dimming during non-operational periods a simple process. Unfortunately, the occupancy sensor add-on was not available for this project. This assessment is ongoing and will finish in 2013, and will inform future calculated offerings for LEP in the IOU programs.

XENON LAB TESTING – PG&E

In response to quality questions from customers, PG&E instituted a long-term lab test on xenon lamps to determine their performance and reliability over time. This California Lighting Technology Center (CLTC) houses and runs this project. PG&E plans to continue looking at these products through 2013 and into 2014.